

# Medical management of intestinal obstruction in terminal care

Christopher Frank, MD, CCFP

## ABSTRACT

**OBJECTIVE** To review the evidence on the effectiveness of medical management of bowel obstruction for patients with advanced cancer and to summarize treatment options for home and hospital care.

**DATA SOURCES** Articles were identified by searching MEDLINE.

**STUDY SELECTION** Research articles published between 1973 and 1995 on the surgical and medical management of bowel obstruction in patients with advanced cancer were identified. Seven original research articles on medical management were identified and all were reviewed and critically appraised. Given the small number of original papers in this field, studies using prospective and retrospective methodology were included. Articles looking only at the use of percutaneous gastrostomy tubes and subcutaneous hydration were used in the formulation of treatment recommendations but were not critically reviewed. A critical appraisal of the surgical literature was not undertaken.

**SYNTHESIS** Recommendations regarding medical management of bowel obstruction were based on strength of evidence for improving symptoms with pharmacologic treatment. The few clinical trials were uncontrolled trials with small samples. The trials show improvement of symptom control with pharmacologic management using morphine, anticholinergics, major tranquilizers, corticosteroids, and somatostatin analogues. Intravenous hydration was unnecessary for most patients. Percutaneous gastrostomy tubes are effective for patients with proximal intestinal obstruction and intractable vomiting.

**CONCLUSIONS** Pharmacologic management and percutaneous gastrostomy for intractable vomiting and hypodermoclysis or oral fluids for hydration can control symptoms without surgery or nasogastric tubes.

## RÉSUMÉ

**OBJECTIF** Passer en revue les preuves démontrant l'efficacité du traitement médical de l'obstruction intestinale chez les patients porteurs d'un cancer au stade avancé et résumer les options thérapeutiques applicables aux soins à domicile et à l'hôpital.

**SOURCE DES DONNÉES** Recension d'articles identifiés par une recherche dans MEDLINE.

**SÉLECTION DES ÉTUDES** Articles de recherche publiés entre 1973 et 1995 sur le traitement médical et chirurgical de l'obstruction intestinale chez les patients porteurs d'un cancer au stade avancé. On a identifié sept articles de recherche originale portant sur le traitement médical qui ont tous fait l'objet d'une révision et d'une évaluation critique. À cause du faible nombre d'articles de recherche originale dans ce domaine, nous avons ajouté les études comportant une méthodologie prospective et rétrospective. Dans l'élaboration des recommandations thérapeutiques, nous avons ajouté les articles qui se limitaient à l'utilisation des tubes de gastrostomie percutanée et à l'hydratation sous-cutanée mais ces articles n'ont pas fait l'objet d'une évaluation critique. La littérature chirurgicale n'a également pas fait l'objet d'une évaluation critique.

**SYNTHÈSE** Les recommandations touchant le traitement médical de l'obstruction intestinale reposent sur la fermeté des preuves démontrant l'efficacité de la pharmacothérapie à améliorer les symptômes. Les quelques essais cliniques étaient non contrôlés et comportaient de faibles échantillons de patients. Les essais cliniques montrent une meilleure maîtrise des symptômes lorsque le traitement pharmacologique fait appel à la morphine, aux anticholinergiques, aux tranquillisants majeurs, aux corticostéroïdes et aux analogues de la somatostatine. Chez la plupart des patients, l'hydratation intraveineuse n'est pas vraiment nécessaire. Les tubes de gastrostomie percutanée sont utiles chez les patients porteurs d'une obstruction intestinale proximale et qui présentent des vomissements résistants au traitement.

**CONCLUSIONS** Le traitement pharmacologique et la gastrostomie percutanée peuvent maîtriser les vomissements rebelles et éviter d'avoir recours à la chirurgie ou aux tubes nasogastriques ; il en est de même pour l'hypodermoclyse et les liquides par voie orale pour maintenir l'hydratation.

*Can Fam Physician* 1997;43:259-265.

**A**lthough the role of family medicine in hospital-based palliative care is currently under debate, most medical care for dying patients at home and in nursing homes is provided by family physicians. A common challenge encountered by physicians providing terminal care in these settings is the management of bowel obstruction.

This complication occurs most often among patients with ovarian and colorectal cancers. Up to 42% of patients with ovarian cancer and 28% of patients with colorectal cancers develop intestinal obstruction, usually shortly before death.<sup>1,2</sup>

In the past, bowel obstruction in patients with advanced cancer has been managed surgically or conservatively using intravenous fluids and nasogastric (NG) tubes.<sup>3</sup> However, up to 50% of cancer patients with bowel obstruction are considered inoperable using a variety of criteria<sup>4-8</sup> (Table 1). In addition, studies looking at the effectiveness of surgical management tend to focus on such outcome measures as 60-day survival rates,<sup>8</sup> rather than symptom control and quality of life, which are of importance to physicians providing palliative care. Studies that have examined more relevant clinical end points have questioned the effectiveness of the surgical approach to this problem.<sup>3,9-11</sup>

As a result of these concerns, new methods of medical management of obstruction have been developed over the last 10 years to allow patients to maintain good symptom control at home without surgery or NG tubes. The approach employs drugs commonly used by family physicians providing palliative care that can be instituted for home care with relative ease. One review of the literature looked at medical management of bowel obstruction.<sup>12</sup> The review was published in the palliative care literature rather than a journal widely read by Canadian family physicians and did not appraise the quality of the original research studying this clinical problem.

This paper is a systematic review of the literature on palliative management of bowel obstruction in patients with advanced cancer. I will outline the options available to family physicians to provide effective terminal care for these patients at home, in hospices, or in nursing homes.

## Methods

Articles used for this paper were identified on MEDLINE from 1991 to October 1995. The MeSH headings

**Dr Frank** is a Lecturer in the Department of Medicine and Family Medicine at Queen's University and practises at St Mary's of the Lake Hospital in Kingston, Ont.

used were intestinal obstruction, intestinal obstruction and diagnosis, intestinal obstruction and therapy, neoplasms, palliative treatments, terminal care, and octreotide for therapeutic use. English-language review articles and original research articles from the surgical and palliative care literature were included.

**Table 1: Prognostic factors of poor response to surgical management**

Intestinal motility problems due to diffuse intraperitoneal carcinomatosis
Cachectic patient older than 65 years
Ascites requiring frequent paracentesis
Low serum albumin
Previous radiotherapy of abdomen and pelvis
Palpable intra-abdominal masses and liver involvement, distant metastases, or pleural effusion
Multiple sites of obstruction
Poor functional status

*Data from Fernandes et al.,<sup>4</sup> Lund et al.,<sup>5</sup> Gallick et al.,<sup>6</sup> Annet and Jolly,<sup>7</sup> and Larson et al.<sup>8</sup>*

All original articles looking specifically at medical management of intestinal obstruction were critically appraised. Although randomized, controlled trials were sought, none were found. Prospective uncontrolled trials, case-control studies, and chart reviews were included despite weaker methodologic rigour. Exceptions to the inclusion criteria for critical review were studies dealing with use of hypodermoclysis and percutaneous gastrostomy tubes. These studies are referred to in the summary of treatments in this paper but were not critically appraised.

## SYNTHESIS

A review of the literature identified seven original articles studying medical management of obstruction. All of these were reviewed and used to synthesize a summary of treatment options (Table 2<sup>3,9-11,13-15</sup>). Two articles looking at the use of venting gastrostomies are referred to in this article but were not critically reviewed.

The first original article dealing with the pharmacologic treatment of intestinal obstruction to appear

in the literature was published in 1985 by Baines and colleagues in *The Lancet*.<sup>3</sup> In this study, 38 patients at St Christopher's Hospice presenting with intestinal obstruction were treated medically for inoperable obstruction. Intestinal colic was found in 29 of 38 cases and was reported as severe in eight and moderate in nine. Medical treatment using loperamide, sublingual and subcutaneous scopolamine, and atropine eliminated colic in 26 of these patients. Only two continued to report moderate colic.

Thirty-five patients reported abdominal pain other than colic, thought to be caused by abdominal distention, hepatomegaly, or tumour masses. This pain was generally well controlled with regular analgesia, most commonly narcotics given by mouth, by rectum, or subcutaneously. All 38 patients developed nausea and vomiting, and this was the most difficult symptom to eradicate. With medical treatment, most subjects had a decrease in nausea and vomiting. The agents found to be most effective for nausea and vomiting due to intestinal obstruction were phenothiazines and butyrophenones. Chlorpromazine, prochlorperazine, haloperidol, and methotrimeprazine were all used with success. Metoclopramide and domperidone were found to be ineffective and in some cases increased pain from abdominal colic.

Of the 38 patients treated medically, the mean survival from onset of obstruction was 3.7 months. Seven patients survived with intestinal obstructions for longer than 7 months; one patient died 1 year after onset. For the 10 patients in whom laparotomy showed no further procedure to be possible, the mean survival time was 2.9 months. These survival times compare favourably with those of patients treated surgically.<sup>8,16-21</sup>

In the only Canadian study identified, Fainsinger et al<sup>10</sup> found that medical management could be used to treat intestinal obstruction in a hospital palliative care unit. One hundred consecutive admissions to the Palliative Care Unit at Edmonton General Hospital were retrospectively reviewed to assess the prevalence and efficacy of treatment of conditions commonly seen in palliative care, including 15 cases of bowel obstruction. Based on the existing literature and clinical experiences, the staff at the Edmonton General Hospital palliative care unit formally developed an approach to bowel obstruction as follows:

- exclude constipation;
- consider surgery;

- provide pain management via intermittent subcutaneous injection of narcotics and anticholinergics;
- manage nausea with metoclopramide via intermittent subcutaneous injection or continuous subcutaneous injection unless complete obstruction is present, and with dexamethasone, haloperidol, chlorpromazine, dimenhydrinate, or scopolamine butylbromide by intermittent subcutaneous injection;
- provide hydration by hypodermoclysis;
- use NG tubes occasionally for short periods; and
- use percutaneous gastrostomy tubes for nausea and vomiting uncontrolled by medical management.

Of the 15 patients studied, 13 were admitted with obstructive symptoms. Visual analogue scales showed improvement in nausea scores and an expected increase in drowsiness scores before death. Pain scores showed a small increase in pain during the 2-week period before death. Mean duration of treatment was 18 days with a range of 2 to 41 days. All patients were treated with dexamethasone at a median dose of 40 mg/d (range 8 to 60 mg/d). One patient with complete obstruction treated with dexamethasone regained bowel function; however, the authors<sup>10</sup> caution that the role of dexamethasone in preventing progression to complete obstruction is unclear.

Two patients had NG tubes at time of admission. Both were removed during their stay (at day 2 and 10, respectively) without recurrence of symptoms. One patient required NG tube insertion during admission for vomiting secondary to proximal gastrointestinal (GI) obstruction; symptoms were well controlled until death 4 days later. Three patients had percutaneous gastrostomy tubes at admission and one required insertion during hospital stay. These rates are similar to those cited in other studies.<sup>9,11</sup>

Despite the lack of large controlled trials reviewing the efficacy of medical management of obstruction in terminal care, the studies cited above and in **Table 2**<sup>3,9-11,13-15</sup> do provide compelling evidence that symptomatic relief is possible using this approach. This is especially true when considering the limitations of alternative therapies, such as surgery, for controlling symptoms. As most of the studies have looked at patients in palliative care units, the difficulty of generalization to home patients should be considered. Previous studies have included small samples of home care patients but not in sufficient numbers to make strong conclusions.

**Table 2: Critical review of original articles on management of intestinal obstruction in advanced cancer patients**

STUDY	SAMPLE	DESIGN	OUTCOME	QUALITY
Medical management of intestinal obstruction in patients with advanced malignant disease Baines et al <sup>3</sup>	38 consecutive patients treated medically for intestinal obstruction due to advanced malignant disease at St Christopher's Hospice in London	Prospective uncontrolled trial	Colic was eliminated in 17 of 29 subjects reporting colic. Only two patients continued to complain of moderate colic. 35 of 38 patients reported abdominal pain from other sources. This pain was eliminated in 31 patients, with four reporting only mild pain. All patients reported nausea and vomiting, which was eliminated in five patients and was reduced to mild in 29 patients. All patients tolerated a fluid diet. Mean duration of treatment was 3.7 mo (range 1-12 mo). Necropsy showed all obstructions were due to malignancy, with extrinsic compression more common than intraluminal growth	This study of 38 patients was uncontrolled, with no comparison to placebo treatment or to other treatment, such as surgery or nasogastric suction and intravenous hydration. Comparison could be less important than in other clinical trials because clinical outcome in terminal bowel obstruction is predictable, and there is little chance of Hawthorne effect in terminal patients. Symptom improvement was not self-reported by patients but was well delineated and relatively objective. All clinically relevant outcomes were well reported and all patients were accounted for at end of study. Patient sample was referred from a variety of sources and likely reflects patients seen in family physician practices. The therapeutic maneuvers suggested are feasible in most settings
Symptom control in terminally ill patients with malignant bowel obstruction Fainsinger et al <sup>10</sup>	15 patients with bowel obstruction among a cohort of 100 consecutive admissions to Edmonton General Hospital palliative care unit	Retrospective chart review of effectiveness of medical management of obstruction	Mean duration of treatment was 18 d (range 2-41 d). Visual analogue scales showed improvement in nausea for most patients. There was a small increase in pain over course of treatment and an expected increase in drowsiness before death. Two patients with NG tubes at time of admission had these discontinued without recurrence of symptoms. One patient required insertion of NG tube during hospital stay and another patient required a percutaneous gastrostomy tube for poorly controlled vomiting secondary to proximal GI obstruction	Retrospective analysis weakens strength of study. Small sample size is again a limitation. Standardized visual analogue scales were used to assess symptom response objectively, although clinical significance of these scales was not clearly defined. Dose schedules used were clearly outlined. The efficacy of hypodermoclysis was alluded to but was not analyzed in the results
Management of inoperable GI obstruction in terminal cancer patients Ventafridda et al <sup>9</sup>	22 terminally ill patients, 17 being treated at home, five in palliative care unit	Prospective uncontrolled trial using morphine or scopolamine or butylbromide and haloperidol	Pain was significantly decreased after initiation of treatment and continued to improve until time of death. Vomiting was controlled in all but three patients, who required NG tube treatment for intractable vomiting secondary to proximal obstruction. Side effects related to treatment, such as sedation and dry mouth, were more common but were successfully ameliorated using standard measures. Only one of 16 patients reporting thirst required parenteral hydration. The mean duration of treatment was 13.4 d, range 2-50	Once again a small, uncontrolled trial. This study used good outcome measures, which improved significantly with treatment. Most subjects were successfully treated at home
Palliative management of bowel obstruction Reid <sup>11</sup>	16 patients attending Silver Chain Hospice Care Service in Perth, Australia, who died with intestinal obstruction. 10 of these patients died at home, the remainder in hospital	Retrospective chart review with intestinal obstruction	Pharmacologic management was similar to that used by Baines et al. <sup>3</sup> In addition, dexamethasone was used at initial doses of 20 mg/d. Vomiting remained a problem for five patients. Constipation occurred in nine patients	Despite citations in several original research papers, this is a letter to <i>The Medical Journal of Australia</i> reporting experiences with medical management. The small numbers involved, but more importantly the lack of objective outcome measures, limit the usefulness of the article
Use of corticosteroids for symptom management in terminally ill patients Farr <sup>13</sup>	Survey sample of 425 patients admitted under Farr's care to St Mary's Hospice inpatient care in Tucson, Ariz	Retrospective chart review of clinical experience with corticosteroids in terminal care	5% of the sample were taking corticosteroids at time of admission. Nine patients were diagnosed with partial proximal GI tract or small bowel obstruction. Six patients had symptomatic improvement with steroids, which Farr interpreted to equal relief of the obstruction. Two patients had partial relief of obstructive symptoms. Duration of this effect was not studied	Study hindered by small sample size and retrospective nature. In addition, few objective criteria were used to quantify symptoms and little information was given about other treatments offered concurrently. It is unclear if decrease in symptoms and actual resolution of bowel obstruction are connected
Palliation of malignant intestinal obstruction using octreotide Khoo et al <sup>14</sup>	24 patients admitted to hospital palliative care units with intestinal obstruction due to malignancy who were not considered candidates for surgery	Prospective cohort study	14 of 24 patients treated had complete response of nausea with octreotide starting at 100 µg/d via subcutaneous infusion. Four patients had partial response. This response was maintained until death in 16 patients. Volume of NG aspirate decreased in all five patients with tubes	Uncontrolled trial with small numbers. Small numbers were particularly a concern with results of NG aspiration volumes. Concomitant treatment with other agents is not clarified. Objective measures of outcome were used and clinically significant outcomes reported
Octreotide to relieve GI symptoms due to bowel obstruction Mercadante et al <sup>15</sup>	14 patients with advanced cancer monitored at home	Prospective cohort study	Octreotide was administered at 0.3 to 0.6 mg/d by subcutaneous infusion. Other agents were used, including haloperidol and opioids given parenterally. Episodes of vomiting, volume of NG aspiration, Karnofsky status, and visual analogue scale for pain were followed. Mean survival time from obstruction was 17.5 d (range 3-53 d)	Limitations were small numbers and no comparison group. Clinically significant outcomes were followed and showed improvement. There was no comparison between pain complaints before initiation of octreotide and after treatment. The authors clearly listed concurrent treatments with other agents to decrease possibility of confounding variables

## PALLIATIVE TREATMENTS FOR BOWEL OBSTRUCTION

### Pharmacologic management

Studies suggest that pharmacologic treatment of bowel obstruction in patients with advanced cancer is efficacious and offers advantages over traditional surgical or conservative approaches. **Table 3**<sup>3,9-11,13-15,22</sup> summarizes the pharmacologic agents used in palliative management of obstruction and lists dosages used in clinical studies.

Many of the agents listed in **Table 3**<sup>3,9-11,13-15,22</sup> are commonly used to treat pain, colic, and nausea and vomiting due to causes other than bowel obstruction. The literature suggests that this extrapolation to advanced cancer patients with bowel obstruction is valid. Narcotics have been shown to be effective for pain due to abdominal distention, hepatomegaly, and tumour masses. They can be given by a variety of routes, but are often given subcutaneously because nausea and vomiting can interfere with oral administration. Anticholinergic agents are effective for treatment of the colicky abdominal pain often seen with bowel obstruction.<sup>3,9-11</sup>

Nausea and vomiting occur in most patients with intestinal obstruction.<sup>3</sup> As with other visceral disturbances, the main neural pathways mediating this symptom are vagal and sympathetic afferents to the vomiting centre. The main neurotransmitters involved peripherally include histamine, dopamine, serotonin, and acetylcholine. The main receptors involved in this response at the vomiting centre are histaminergic and muscarinic cholinergic.<sup>23</sup>

Because multiple receptors and neurotransmitters are involved, no single class can be said to be drugs of choice for treating nausea and vomiting caused by intestinal obstruction. Anticholinergic agents have been shown to be helpful in reducing nausea as well as colicky pain. Major tranquilizers, such as prochlorperazine, haloperidol, and methotrimeprazine, have also been found to be effective.<sup>3,9-11</sup> Antihistamines have been effective in several studies but have usually been given in conjunction with other agents, such as major tranquilizers.<sup>9,10</sup> Use of octreotide is reviewed below. No studies using the serotonin-blocking agent ondansetron for palliative treatment of nausea and vomiting in intestinal obstruction were found. The main indication for ondansetron remains the treatment of chemotherapy-induced nausea and vomiting.

A relatively new agent being used for nausea and vomiting is octreotide. Octreotide is an analogue of somatostatin that has been shown to reduce

**Table 3: Pharmacologic management of bowel obstruction**

### PAIN CONTROL

- Morphine, 2.5 mg q4h subcutaneously, titrating up<sup>3,9-11</sup>
- Hydromorphone, 1 mg q4h subcutaneously, titrating up
- Hydromorphone suppositories, 3 mg q4h rectally, titrating up
- Scopolamine hydrobromide, 0.8-2.0 mg/d subcutaneously
- Scopolamine butylbromide, 40-120 mg/d subcutaneously<sup>3,9,10</sup>
- Loperamide, 2 mg qid<sup>3</sup>

### NAUSEA AND VOMITING

#### Major tranquilizers<sup>3,9-11</sup>

- Methotrimeprazine, 50-150 mg/d subcutaneously
- Chlorpromazine, 50-150 mg q8h subcutaneously or rectally
- Haloperidol, 0.5-1.5 mg/d subcutaneously
- Prochlorperazine, 5-15 mg q8h rectally

#### Anticholinergics<sup>3,9-11</sup>

- Scopolamine butylbromide

#### Antihistamines<sup>9,10</sup>

- Cyclizine, 50-100 mg continuous subcutaneous injection/d
- Dimenhydrinate, 50-100 mg subcutaneously as needed

#### Somatostatin analogues<sup>14,15,22</sup>

- Octreotide, 0.1-0.6 mg/d subcutaneously

### DECREASE OBSTRUCTION

#### Steroids<sup>10,11,13</sup>

- Dexamethasone (starting with 8 mg/d)

#### Prokinetics<sup>10</sup>

- Metoclopramide (not with complete obstruction), 10 mg q4h subcutaneously, 60-200 mg/d subcutaneously by continuous subcutaneous injection
- Domperidone, 10 mg qid by mouth

GI secretions. It inhibits the secretion of several hormones, reduces gastric acid secretion, decreases GI motility, and reduces splanchnic blood flow.<sup>24</sup> These features have been shown to be helpful for diminishing diarrhea in the carcinoid syndrome and for reducing diarrhea induced by vasoactive intestinal peptide-releasing tumours.<sup>14,15,22,25</sup> Given these

## CME

### Medical management of intestinal obstruction in terminal care

effects, somatostatin has been used in palliative care for a variety of GI symptoms, including obstruction, fistulas and enterostomies, short bowel syndromes, and diarrhea from secretory causes.<sup>14,22,26,27</sup> Research into its efficacy is important, as it is an expensive drug and the cost-benefit ratio is very uncertain. The literature about octreotide suggests it is effective in decreasing the nausea caused by malignant obstruction (**Table 2**<sup>3,9-11,13-15</sup>). Octreotide can also reduce pain in patients with obstruction; however, this conclusion was less clear.

The use of corticosteroids in medical management of obstruction is controversial. Only one study<sup>13</sup> has looked specifically at this indication, and its results are not sufficiently convincing. Other studies have suggested that corticosteroids are effective as part of an overall treatment regimen. Despite the lack of evidence, steroids are used by palliative care physicians for this indication, especially when peri-tumour inflammation is thought to play a role in obstruction.

#### Percutaneous gastrostomy and nasogastric tubes

Despite the advances in pharmacologic management of intestinal obstruction among terminal patients, there are still situations where NG and percutaneous gastrostomy tubes are necessary. However, NG tubes are uncomfortable for patients and are not without side effects.<sup>28</sup> Patients have expressed preference for management that avoids NG tube placement.<sup>3</sup>

Percutaneous gastrostomy tubes used as a venting procedure for patients with intractable nausea and vomiting could offer an alternative to the discomfort of NG tubes without requiring a general anesthetic or laparotomy. Most commonly this intervention is offered to patients with proximal intestinal obstruction unresponsive to pharmacologic treatments. Gemlo et al in 1986<sup>29</sup> used percutaneous gastrostomy tubes and intravenous hydration to treat 13 patients with complete bowel obstruction and intractable vomiting effectively at home. There were no complications with the gastrostomies during the series.

#### Hydration

The question of hydration is often raised during terminal care and can become an issue when vomiting is secondary to obstruction. The indications for hydration need to be individualized for each patient, but the main indications for maintaining hydration in terminal cancer patients are:

- preventing dehydration that causes agitated confusion and

- preventing prerenal failure and the accumulation of drug metabolites (ie, morphine-6-glucuronide) that can cause complications, such as seizures or myoclonus.<sup>10</sup>

In the studies by Baines et al<sup>3</sup> and Ventafridda et al,<sup>9</sup> patients were allowed to continue eating and drinking as tolerated. Ventafridda and associates<sup>9</sup> found that complaint of dry mouth increased with treatment but was successfully managed in all but one patient. Baines and colleagues<sup>3</sup> reported that dehydration was not a problem in any of the patients being treated for vomiting. Fainsinger and co-workers<sup>10</sup> also found that most patients tolerated oral fluids, but study patients received daily supplementation of more than 1 L of fluid subcutaneously via hypodermoclysis.<sup>10</sup> This route could be a safe, comfortable, and effective option for providing parenteral fluids to patients with malignant bowel obstruction who are experiencing adverse symptoms secondary to dehydration.

#### Conclusion

Like many other treatments used in palliative care, the medical management of intestinal obstruction has been studied using small, uncontrolled samples in palliative care or hospital units. Often the efficacy of single agents has been unclear because they have been studied only as part of an overall treatment regimen. Several classes of drugs, most notably corticosteroids, are commonly used empirically despite little evidence of their efficacy in the literature.

These shortcomings suggest a need for further research in this area. Research is also needed to clarify the effectiveness of pharmacologic treatment versus traditional conservative management with NG tubes and intravenous hydration. The ethics and efficacy of these techniques for non-malignant obstruction in elderly patients should also be explored. Finally, a larger study of medical management among patients receiving terminal care at home would help foster acceptance of this treatment by physicians providing home palliative care.

This paper aimed to provide physicians with options for managing bowel obstruction in terminally ill patients. This is particularly relevant to family physicians, who often provide care in a variety of non-hospital settings, such as patients' homes, hospices, and nursing homes. Despite its limitations, a pharmacologic approach using antispasmodics, analgesics, antiemetics, corticosteroids, and somatostatin analogues has been shown to be effective at reducing the symptoms of obstruction. When these medications

are used in conjunction with percutaneous gastrostomy tubes and hydration using hypodermoclysis or oral fluids, most terminally ill patients who are not operative candidates can be managed without intravenous fluids and NG tubes. ♣

**Correspondence to:** Dr Christopher Frank, St Mary's of the Lake Hospital, Department of Geriatrics, 340 Union St, Kingston, ON K7L 5A2

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